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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/708,085	11/08/2000	Nobuhiro Jiwari	0819-450	9875

22204 7590 12/17/2001

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EXAMINER

NGUYEN, THANH T

ART UNIT PAPER NUMBER

2813

DATE MAILED: 12/17/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/708,085

Applicant(s)

JIWARI ET AL.

Examiner

Thanh T. Nguyen

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2001.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9 are stand rejected under 35 U.S.C. 103(a) as being unpatentable over Akahori et al. (U.S. Patent No. 6,218,299) in view of Homma et al. (U.S. Patent No. 5,420,075) or Kobayashi et al. (U.S. Patent No. 6,214,748).

Akahori et al. substantially discloses a method of forming a semiconductor device which includes: forming metal line (14, fig. 7a+), depositing an interlayer insulating film (13a) made of fluorine-containing organic film between the metal lines (14) using a material gas containing fluorocarbon as a main component in a reactor chamber of plasma processing apparatus, (col. 4, lines 30+, col. 6, lines 50+), densifying the fluorine-containing organic film by exposing the plasma of rare gas Ar in the same reactor chamber (col. 7, lines 20+).

However, the reference does not teach photoresist patterning the metal lines.

Homma et al. discloses a method of forming a semiconductor device, which includes: forming metal lines (3, 4, 5) by known patterning methods such as with a photoresist masking and etching the conductive metal with plasma reactive ion etching (col. 4, lines 1+), filling the gap between the metal lines with insulating layer (7).

Kobayashi et al. discloses a method of forming a semiconductor device, which includes: forming metal lines (3c)) by known patterning methods such as with a photoresist masking and

Art Unit: 2813

etching the conductive metal with plasma etching (col. 5, lines 50+), filling the gap between the metal lines with insulating layer (4).

Therefore, it would have been obvious to one of ordinary skill in the requisite art at the time the invention was made to modify Akahori's process of forming metal lines (14) with photoresist patterning and etching the metal with plasma etching to form metal lines as suggested by Homma or Kobayashi because the technique of photoresist patterning to form metal line is well known in the art.

Response to Arguments

Applicant's arguments filed 11/9/01 have been fully considered but they are not persuasive.

Applicant contends none of the prior art teaches or suggested a step of densifying a fluorine-containing organic film by exposing the fluorine-containing organic film to plasma of a rare gas in a reactor chamber. In response to applicant since fluorine-containing organic film is exposed to the argon plasma gas. Hence, it is obvious that fluorine-containing organic film will be densified.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

Art Unit: 2813

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

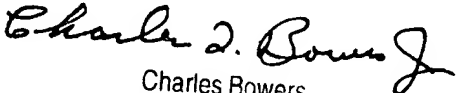
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Nguyen whose telephone number is (703) 308-9439, or by Email via address Thanh.Nguyen@uspto.gov. The examiner can normally be reached on Monday-Thursday from 7:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Bowers, can be reached on (703) 308-2417. The fax phone number for this Group is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956 (See MPEP 203.08).

Thanh Nguyen

December 10, 2001


Charles Bowers
Supervisory Patent Examiner
Technology Center 2800